Content and evaluation of the Benefits of Effective Exercise for Older Adults with Knee Pain trial physiotherapist training programme

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Running head: BEEP trial physiotherapist training programme

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Abstract

Objective: To explore whether participating in the BEEP trial training programme (ISRCTN93634563) increased physiotherapists' self-confidence, and changed their intended clinical behaviour, regarding exercise for knee pain in older adults.

Design: Before/after training programme evaluation. Physiotherapists were asked to complete a questionnaire before the BEEP trial training programme, immediately afterwards, and 12-18 months later (post-intervention delivery in the BEEP trial). The questionnaire included a case vignette and associated clinical management questions. Questionnaire responses were compared over time and between physiotherapists trained to deliver each intervention within the BEEP trial.

Setting: Primary care.

Participants: 53 physiotherapists who completed the BEEP trial training programme.

Interventions: NA

Main outcome measures: 1. Self-confidence in the diagnosis and management of knee pain in older adults, 2. intended clinical behaviour measured by a case vignette and associated clinical management questions.

Results: 52 (98%) physiotherapists returned the pre-training questionnaire, 44 (85%) and 39 (74%) returned the post-training and post-intervention questionnaires respectively. Post-training, self-confidence in managing older adults with knee pain increased, and intended clinical behaviour regarding exercise for knee pain in older adults appeared more in line with clinical guidelines. However, not all positive changes were maintained in the longer-term.

Conclusion: Participating in the BEEP trial training programme increased physiotherapists' self-confidence and changed their intended clinical behaviour regarding exercise for knee pain but by 12-18 months later, some of these positive changes were lost. This suggests that brief training programmes are useful, but additional strategies are likely to be needed to successfully maintain changes in clinical behaviour over time.

Key words: Physiotherapists, exercise, knee pain, older adults, training programme.

Abbreviations: BEEP: Benefits of Effective Exercise for knee Pain, ITE: Individually Tailored Exercise, NHS: National Health Service, NICE: National Institute for Health and Care Excellence, OA: Osteoarthritis, RCT: Randomised Controlled Trial, TEA: Targeted Exercise Adherence, UC: Usual Care.

Knee pain attributable to osteoarthritis (OA) is a common and disabling problem in older adults (1,2). Its burden is set to rise given the ageing, increasingly obese population (1,3). No cure is currently available for OA and as such treatment aims to improve pain and function, and enhance quality of life (4). Exercise is recommended as a core treatment for older adults with knee pain (5-9), although its effect sizes are small and often decline over time (8,10). There could be several explanations for this, including inadequate exercise dose or progression, or poor exercise adherence. A new randomised controlled trial (RCT), the BEEP trial (Benefits of Effective Exercise for knee Pain, ISRCTN: 93634563) is testing the effectiveness of two physiotherapy-led exercise interventions for older adults with knee pain to improve the individual tailoring of, and adherence to exercise, compared with usual physiotherapy care (11).

Physiotherapists commonly prescribe exercise for older adults with knee pain, however disparities exist between how they currently deliver exercise for this patient group and best practice recommendations (9). Although they routinely use advice and exercise, they deliver it over relatively few treatment sessions (thus reducing the capacity for adequate exercise progression), do not robustly monitor adherence, or focus on increasing general physical activity (12,13). Closing the gap between physiotherapy practice behaviour and best practice recommendations could help to optimise health outcomes for patients.

Different strategies can be used to implement guideline recommendations and behaviour change amongst healthcare professionals, including educational strategies, reminders, financial incentives and use of local opinion leaders, with

varying results (14-17). At present little is known about the effectiveness of interventions designed to align physiotherapists' clinical behaviour regarding exercise for older adults with knee pain with current clinical guidelines and exercise recommendations (5,9). This study therefore aimed to explore whether participating in the BEEP trial training programme increased physiotherapists' self-confidence, and changed their intended clinical behaviour, regarding exercise for knee pain in older adults. It also aimed to explore whether changes were sustained at longer-term follow-up, 12-18 months after the training programme.

Methods

Fifty three physiotherapists from 11 National Health Service (NHS) clinics in the West Midlands (UK) were trained to deliver one of the three exercise-based interventions within the BEEP trial: 'usual physiotherapy care' (UC) (control group consisting of up to 4 treatment sessions of advice and exercise), 'individually tailored exercise' (ITE) (an individualised, supervised and progressed lower-limb exercise programme delivered over 6-8 treatment sessions), and 'targeted exercise adherence' (TEA) (supporting patients to adhere to exercise and to engage in general physical activity over the longer-term, delivered over 8-10 treatment sessions) (appendix one). There were no inclusion/ exclusion criteria with regards to physiotherapists being able to participate in the BEEP trial. The intervention each physiotherapist delivered was based on their availability to treat patients for the protocolised number of treatment sessions for each intervention for the duration of the BEEP trial, and availability to attend the allocated number of days of training for each intervention (UC: 1 day, ITE: 3 days, TEA: 5 days, described below). Ethical approval for the BEEP trial was obtained from North West Research Ethics Committee (ref: 10/H1017/45).

Content of the training programme

The BEEP trial training programme was stepped. All physiotherapists attended the first day and received an update about OA, based on the National Institute for Health and Care Excellence (NICE) OA guidelines (5). Key components of day one included the central role of exercise as a 'core' treatment for older adults with knee pain, evidence about current physiotherapy practice for knee pain in older adults and OA,

and the discordance between physiotherapy practice and current clinical guidelines (5,9).

Days two and three were attended by physiotherapists delivering the ITE and TEA interventions. These days focused on how to improve outcomes from exercise for older adults with knee pain. The importance of individualisation, progression and supervision of lower limb exercise was highlighted from both a physiological and psychological perspective. Exercise self-efficacy was discussed as an important predictor of exercise behaviour (18,19) and emphasis was placed on the importance of 'selling' exercise to patients. Tools to facilitate physiotherapists to individualise, supervise and progress exercise were provided and practised, including developing computerised print-outs of individualised exercise programmes, goal setting, and use of exercise diaries.

Days four and five were only attended by physiotherapists delivering TEA. These days focused on the importance of exercise adherence, the physiotherapist's role in facilitating behaviour change, and shifting from a lower limb exercise programme to physical activity that can be sustained over the long-term. A number of behavioural models were drawn on, including self-efficacy (18) and self-regulation theory (20). Each physiotherapist was provided with an 'adherence enhancing toolkit' that contained different educational and behavioural tools for facilitating exercise behaviour change, to be selected for use based on an individualised assessment of each patient (e.g. behavioural contracts, pedometers, set back plans). Use of each

tool was practised through role play and participating physiotherapists were also encouraged to practice using them within routine clinical practice.

In order to promote behaviour change, based on previous research (21-26) and previous experience (17), the training programme was delivered using different strategies including lectures, interactive workshops, role play, group discussion, problem solving and case studies, with homework set to consolidate learning. In addition, approximately 10 months after the training programme, all physiotherapists were invited to attend a half-day workshop to share best practice and discuss any challenges faced with other physiotherapists delivering the same intervention. Twenty-six physiotherapists attended this additional workshop.

Evaluation of the training programme

The BEEP trial training programme was evaluated using a before/after study design. Physiotherapists were asked to complete a questionnaire before the training (pre-training), immediately afterwards (post-training), and after delivering the exercise interventions within the BEEP trial (post-intervention, approximately 12-18 months after the training). The content of the questionnaire was based on a previous national survey of UK physiotherapists' intended clinical management of older adults with knee pain (12,13).

Questionnaire content

A vignette representing a typical primary care patient over 45 years of age with moderate knee pain (appendix two) with clinical management questions was used to measure intended clinical behaviour. Questions sought information on physiotherapists' intended treatment approach, pattern of treatment (e.g. number of treatment sessions that would be provided), and their specific use of exercise therapy (e.g. exercise type, its delivery, and monitoring of exercise adherence). To explore physiotherapists' self-confidence in the diagnosis and management of knee pain in older adults, a measure of practitioner self-confidence in acute low back pain (27) was adapted for use with older adults with knee pain. This includes four questions, responses to which are summed (potential range 4-20), with lower scores indicating greater self-confidence. The pre-training questionnaire also included questions on physiotherapists' professional characteristics, for example number of years qualified and previous training undertaken on OA and exercise therapy.

Data analyses

Data analyses were carried out using Stata version 13.0 (Stata Corporation, TX, USA). Descriptive statistics were used to describe the sample, compare results over time (pre-training, post-training, and post-intervention) and between physiotherapists trained to deliver each BEEP trial intervention. Median scores were provided for the measure of physiotherapists' self-confidence in diagnosing and managing knee pain in older adults, as data were positively skewed (i.e. most physiotherapists had relatively high self-confidence in managing older adults with knee pain). Changes over time and differences between groups of physiotherapists (i.e. those trained to

deliver each BEEP trial intervention) were not tested for statistical significance given that, although the BEEP trial included a high number of participating physiotherapists (n=53), this number is relatively small for robust statistical testing.

Results

In total, 52 of the 53 physiotherapists (98%) returned the pre-training questionnaire, 44 (83%) returned the post-training questionnaire and 39 (74%) returned the post-intervention questionnaire. Characteristics of participating physiotherapists are shown in table one. There were some slight differences in the characteristics of physiotherapists trained to deliver each intervention. For example, physiotherapists trained to deliver UC had more years of clinical experience than their colleagues. Characteristics of responders and non-responders were similar (appendix three). Several physiotherapists moved jobs or had maternity leave during the overall time period of the BEEP trial.

Self-confidence in managing older adults with knee pain

Pre-training, physiotherapists had a median self-confidence score of 8 (interquartile range (IQR): 7, 9), thus were relatively self-confident in the diagnosis and management of knee pain in older adults. Scores reduced post-training and post-intervention (i.e. self-confidence increased) in physiotherapists who received the ITE and TEA training packages, but not in those who received UC training (table two).

Intended clinical behaviour

Treatment approaches

Pre-training, the most commonly used treatment approach for the patient described in the vignette was exercise therapy (100%), followed by heat/ice (69%), manual therapy (29%), acupuncture (15%), and electrotherapy (12%). In all groups, post-

training, the reported use of manual therapy, acupuncture and electrotherapy alongside exercise all reduced (27%, 5%, 2%, respectively). This pattern was in line with the content of the BEEP training programme and was maintained post-intervention (10%, 5%, 8%, respectively).

At all time-points, nearly all physiotherapists reported including some sort of advice as part of their treatment (pre-training 98%, post-training 100%, post intervention 97%). Pre-training, only 45% reported they would provide advice to the vignette patient about increasing general physical activity. Although this increased post-training (80%), this was only maintained post-intervention by physiotherapists trained to deliver the ITE and TEA interventions (table three).

Use of therapeutic exercise

At all time-points, local strengthening exercises and flexibility/ range of movement exercises were the most common types of exercise prescribed. Pre-training, only 17% of physiotherapists reported they would prescribe an aerobic training programme for the vignette patient. Although this increased post-training (36%), particularly for physiotherapists trained to deliver the TEA intervention, this was not maintained in any group post-intervention (table four).

Pre-training, during the patient's initial treatment session, only 65% of physiotherapists reported that they would supervise the exercise programme. This increased post-training (84%) and post-intervention (95%) in all three groups of

physiotherapists (table five). Reported supervision of exercise during a patient's follow-up sessions increased in all groups pre-training to post-training (pre-training: UC 73%, ITE 86%, TEA 73%, post-training: UC 100%, ITE 94%, TEA 93%), although this was only maintained post-intervention in those trained to deliver ITE and TEA interventions (UC 77%, ITE 100%, TEA 91%). Reported provision of written exercise information during follow-up sessions also increased in the ITE and TEA groups, but not in those trained to deliver UC (table five).

At all time-points, nearly all physiotherapists reported they would check that the patient was completing their exercise programme (pre-training 98%, post-training 100%, post-intervention 100%), mainly through observing exercise technique and verbal questioning. Pre-training, only 6% of physiotherapists reported that they would monitor adherence using an exercise diary (UC 0%, ITE 10%, TEA 7%). This markedly increased in those trained to deliver the ITE and TEA interventions post-training (53% and 60%, respectively) and post-intervention (60% and 73%, respectively), but not in those trained to deliver UC (post-training 8%, post-intervention 15%). These changes were in line with the content of the training programme.

Pattern of treatment

Pre-training, physiotherapists reported that they would provide a mean of 4.14 (SD 1.21) treatment sessions for the vignette patient. This remained consistent in physiotherapists trained to deliver UC, but increased slightly in those trained to

deliver the ITE intervention (post-training: 4.62 (SD 1.04), post-intervention: 4.92 (SD 0.86)) and the TEA intervention (post-training: 5.50 (SD 1.09), post-intervention: 5.60 (SD 1.17)). Pre-training, 40% of physiotherapists said they would follow-up the patient after discharge from physiotherapy services. This increased only in those trained to deliver the TEA intervention. This group also changed how they would offer follow-up, with 45% offering telephone follow-up appointment post-training, compared to none utilising this approach pre-training. This change was maintained post-intervention.

Discussion

This study aimed to explore whether taking part in the BEEP trial training programme increased physiotherapists' self-confidence in managing older adults with knee pain, and changed their intended clinical behaviour regarding exercise for knee pain in older adults. It also investigated whether changes were sustained at longer-term follow-up, 12-18 months after the training programme.

Pre-training, physiotherapists appeared relatively self-confident in their ability to diagnose and manage older adults with knee pain. However, as seen previously (12,13), there were some disparities between their intended clinical behaviour and best practice exercise recommendations (5,9). Disparities included providing exercise over relatively few treatment sessions alongside additional interventions, a lack of focus on general physical activity, limited supervision of exercise and lack of robust assessment of exercise adherence. Post-training, there were some changes in the intended clinical behaviour in all groups of physiotherapists in line with the content of the training programme. Use of additional interventions alongside the exercise programme reduced, there was a greater focus on general physical activity, and supervision of exercise increased. This therefore demonstrates that taking part in the BEEP trial training programme, including the one-day UC training package, aligned physiotherapists' intended clinical behaviour regarding exercise for knee pain in older adults with best evidence. As physiotherapists commonly treat older adults with knee pain, and nationally there are disparities between their use of exercise for this patient group and recent exercise and clinical guidelines (5,9,12,13), offering

brief educational workshops that are relatively inexpensive to run and easy to attend by clinicians, may help to bridge this gap.

Changes in intended behaviours appeared more pronounced in physiotherapists trained to deliver the ITE and TEA interventions, and their self-confidence in diagnosing and managing older adults with knee pain also increased. This may be because more specific, targeted messages about the role of exercise for knee pain and how to prescribe it were provided. Alternatively, it may be related to differences in the delivery of the training programmes. Both the ITE and TEA training packages were longer than the UPC training package (UC: 1 day, ITE: 3 days, TEA: 5 days) and included more interactive elements, such as role play, group discussion and problem solving. Physiotherapists were also provided with practical tools with a theoretical underpinning to use when delivering exercise for older adults with knee pain, and time was spent practicing using these tools. Although it is impossible to identify which specific component(s) may have helped to facilitate greater change, it highlights that in addition to targeting specific messages within training programmes, considering how these messages are delivered is also likely to be important.

However, even within physiotherapists who participated in the ITE and TEA training programmes, not all changes in intended clinical behaviour were maintained in the longer-term, 12-18 months later. Advice about increasing general physical activity, supervision of exercise, and focusing on aerobic training and functional task training all reduced in at least one group of physiotherapists. Change in intended clinical behaviour may not have been maintained over time because of service issues (e.g.

lack of time), the influence of significant clinical peers, their own clinical experience causing mistrust of novel concepts introduced within the training programme, or physiotherapists may simply have reverted to their usual and more familiar pattern of practice (28). Multi-modal approaches to changing clinical practice that not only target individual health care professionals, but also address other potential barriers to long-term behaviour change are likely to be important (14,29).

Comparison to other studies

The findings from this study, that: a) brief training programmes can play a role in changing clinical behaviour; b) how training programmes are delivered is important, and; c) multiple strategies are likely to be needed to facilitate long-term change, are supported by other literature (14,15,16,24,30). A Cochrane review exploring the effect of education on the clinical practice of health professionals found moderate to large statistically significant effects for interventions that included interactive workshops, but no statistically significant changes for didactic presentations only (24). Systematic review evidence also supports the usefulness of multifaceted strategies and the need for interventions with multi-level approaches, including involving decision-makers, in order to effectively change clinical practice and adherence to clinical guideline recommendations (14,15).

Research and clinical implications

Taking part in the BEEP trial training programme appeared to increase self-confidence and change some intended clinical behaviour of physiotherapists,

319 although the difference in these changes between groups of physiotherapists were
320 not tested for statistical significance given the small number of physiotherapists. As
321 the one-day UC training programme appeared to change some intended clinical
322 behaviours, providing such events may be a good starting point in attempting to
323 bridge the current best evidence – clinical practice gap. Future educational
324 programmes need to consider different delivery methods, and targeting different
325 levels in the health care system (patients, the individual clinician, the health care
326 team, and the wider health care organisation) for changes in clinical practice to be
327 maintained. Further research is required to determine how effective such strategies
328 would be.

329

330 **Strengths and limitations**

331 The BEEP trial included a large number of physiotherapists in comparison to other
332 RCTs (31-33), who pre-training, had similar intended clinical behaviours to a national
333 sample of physiotherapists in the UK (12,13). Despite good follow-up rates to the
334 post-training and post-intervention questionnaires, the numbers of participating
335 physiotherapists were too small to permit statistical analysis of the differences
336 between groups or over time. Results must therefore be interpreted in light of these
337 small numbers. In addition, physiotherapists were not randomised to receive each
338 training programme, they were selected in negotiation with their managers, based on
339 their availability to attend the training and deliver the interventions within the BEEP
340 trial. There were some slight differences in the characteristics of physiotherapists
341 that undertook each training programme which may contribute to the changes seen
342 in intended clinical practice. This, and the fact that all physiotherapists volunteered to

take part in the trial, and may therefore be more receptive to change than those not willing to be involved in research, may reduce the generalisability of the findings. During the course of the BEEP trial physiotherapists completed a case report form for every participant that they treated, had regular contact with the study team, and some (n=26) attended the additional half-day workshop. These factors may have reinforced the messages received during the training programme, therefore the changes at 12-18 months may overestimate the likely changes seen from only a one-off educational event. Finally, the measure of physiotherapists' clinical practice was self-reported intended clinical behaviour, on the basis of a vignette. Clinical vignettes have a number of advantages over other methods of measuring clinical behaviour (e.g. simulated patients, direct observation and medical record review). Advantages include: easy administration, less cost (34), responses are not influenced by inaccurate recall nor the problem of the Hawthorne effect under direct observation (35), they can control for case mix, and variables of interest can easily be altered (for example, severity of pain or functional limitations) thus allowing comparison across different groups of health care professionals (36). Although vignettes have been shown to reliably assess intended clinical behaviour (34, 37, 38, 39), we recognise that they invoke an essentially 'artificial' situation, therefore responses may not reflect the actual behaviour that would occur in real practice (36). In addition, as responses were via self-report questionnaires, and returned to a member of the study team who delivered the training programme, they may have been subject to social desirability bias (36). Therefore, it is possible that in clinical practice, physiotherapists may use therapeutic exercise differently.

Conclusions

Participating in a dedicated training programme as part of a RCT increased physiotherapists' self-confidence in managing older adults with knee pain, and changed some aspects of their intended clinical behaviour regarding exercise for knee pain in older adults. However, by 12-18 months later, some of these positive changes were lost. This suggests that attending brief training programmes (particularly those that are highly focused) is useful in terms of prompting changes in clinical practice, but additional strategies are likely to be required to successfully maintain changes in clinical behaviour over time.

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Appendix one: Summary of the BEEP trial interventions (11)

Key features	Usual Physiotherapy Care	Individually Tailored Exercise	Targeted Exercise Adherence
Number of sessions	Up to 4 sessions	6 to 8 sessions	8 to 10 sessions
Time period of treatment	Up to 12 weeks	Up to 12 weeks	Up to 6 months
General education	Advice and information booklet	Advice and information booklet	Advice and information booklet
Exercise focus	Focus on lower limb exercise	Focus on lower limb exercise	Focus on both lower limb and general exercise. Signposting and support to engage in general physical activity opportunities in local community
Individualisation	Exercises selected from a pre-printed, standardised written template	Exercises individually prescribed for each patient, supported by an individualised, written exercise programme	Exercises individually prescribed for each patient, supported by an individualised, written exercise programme
Progression	Minimal progression	Good progression	Good progression
Supervision	Minimal supervision	Good supervision	Good supervision
Exercise monitoring	No exercise diary	Exercise diary	Exercise and physical activity diaries
Provision of follow-up	No follow-up after 12 weeks	No follow-up after 12 weeks	Follow-up and monitoring contacts (telephone or face to face) through to 6 months

Appendix two: Case vignette representing a typical primary care patient over 45 years of age with moderate knee pain

A 65 year-old woman presents with a three year history of left knee pain, which was of insidious onset and has gradually worsened over time. She is a retired shop manageress and usually enjoys gardening, but this has become difficult due to her knee problem. Her general health is good, despite being overweight and suffering from mild hypertension. She also has pain in both hands.

Today she rates the intensity of her knee pain as 6 out of 10. Descending stairs, bending and rising from sitting all aggravate her knee pain. She has some difficulty when walking, and has started to use a stick outdoors. Her knee is stiff first thing in the morning and after staying in one position for too long. She finds some relief from an anti-inflammatory gel, and takes up to three 200mg ibuprofen tablets per day.

Despite not having an x-ray she feels her problem is due to arthritis as her father suffered from this. It is her first visit to physical therapy and she is optimistic about its outcome. On examination the left knee has a mild effusion and a valgus alignment. Flexion is limited and the quadriceps are weak. The joint line is tender on palpation. No other examination findings are remarkable.

Appendix three: Comparison of responders and non-responders

	Pre-training (n=52)	Post-training		Post-intervention	
		Responders (n=44)	Non-responders	Responders (n=39)	Non-responders
Number of years in practice *Median (IQR)*	9 (4, 23)	8 (4, 23)	13 (4, 21)	10 (5, 23)	6 (3, 15)
Male Gender n (%)	19 (37)	14 (33)	5 (56)	14 (36)	5 (38)
Work exclusively in NHS n (%)	35 (67)	29 (67)	6 (67)	24 (62)	11 (85)
No. of patients usually see over 45 years old with knee pain					
< 1 per month n (%)	4 (8)	4 (10)	0 (0)	2 (5)	2 (15)
≥ 1 per month n (%)	15 (30)	12 (29)	3 (33)	11 (30)	4 (31)
≥ 1 per week n (%)	31 (62)	25 (61)	6 (67)	24 (65)	7 (54)
Received post-graduate training in knee pain in older adults Yes n (%)	14 (27)	14 (33)	0 (0)	12 (31)	2 (15)
Received post-graduate training in exercise therapy Yes n (%)	20 (38)	14 (33)	6 (67)	16 (41)	4 (31)

Table 1: Questionnaire response rate and characteristics of participating physiotherapists

	Total (n=53)	**UC** (n=15)	**ITE** (n=22)	**TEA** (n=16)
Questionnaire response				
Pre-training n (%)	52 (98%)	15 (100%)	22 (100%)	15 (94%)
Post-training n (%)	44 (83%)	12 (80%)	17 (77%)	15 (94%)
Post-intervention n (%)	39 (74%)	13 (87%)	15 (68%)	11 (69%)
Number of years in practice *Median (IQR)*	9 (4, 23)	22.5 (5, 25)	10 (4, 19)	6 (6, 15)
Male Gender n (%)	19 (37)	6 (40)	9 (41)	4 (27)
Work exclusively in NHS n (%)	35 (67)	12 (80)	14 (64)	9 (60)
No. of patients usually see over 45 years old with knee pain				
< 1 per month n (%)	4 (8)	1 (7)	1 (5)	2 (13)
≥ 1 per month n (%)	15 (30)	7 (47)	3 (15)	5 (33)
≥ 1 per week n (%)	31 (62)	7 (47)	16 (80)	8 (53)
Received post-graduate training in knee pain in older adults Yes n (%)	14 (27)	5 (33)	4 (18)	5 (33)
Received post-graduate training in exercise therapy Yes n (%)	20 (38)	3 (20)	12 (55)	5 (33)

Data are number (%) unless otherwise stated. Individual items may not add to totals due to missing data. UC: usual care, ITE: Individually Tailored Exercise, TEA: Targeted Exercise Adherence, IQR: Inter quartile range, NHS: National Health Service

Table 2: Physiotherapists' confidence in diagnosing and managing older adults with knee pain*

Intervention group	Pre-training	Post-training	Post-intervention
UC	*8 (8, 10)*	*8 (6, 8)*	*8 (5, 8)*
ITE	*8 (7, 8)*	*6 (5, 7)*	*5 (4, 7)*
TEA	*8 (5, 10)*	*6 (4, 7)*	*4 (4, 6)*
Total	8 (7,9)	6 (5,8)	5 (4,8)

* All scores are median (IQR) measured by the Practitioner Self-Confidence Scale, developed for use regarding patients with low back pain, adapted for use regarding older adults with knee pain (24). This is the sum of 4 items of self-confidence in diagnosing and managing older adults with knee pain, measured on a 5-point likert scale. Lower scores indicate greater confidence (potential range: 4-20). UC: usual care, ITE: Individually Tailored Exercise, TEA: Targeted Exercise Adherence.

Table 3: Types of advice for the patient case reported by participating physiotherapists

	Pre-training	Post-training	Post-intervention
Yes	**51 (98)**	**44 (100)**	**38 (97)**
Weight loss	47 (92)	43 (98)	37 (97)
Pacing of activities	46 (90)	39 (89)	30 (79)
Use of heat/ice at home	44 (86)	42 (95)	33 (87)
Analgesia	41 (80)	39 (89)	31 (82)
Increasing activity level			
UC	*8 (53)*	*10 (83)*	*7 (58)*
ITE	*8 (38)*	*14 (82)*	*12 (80)*
TEA	*7 (47)*	*11 (73)*	*8 (73)*
Total	23 (45)	35 (80)	27 (71)
Use of walking aids	23 (45)	19 (43)	18 (47)
Use of knee support	6 (12)	3 (7)	4 (11)

Data are number (%) unless otherwise stated. Data only shown by group where differences can be seen. UC: usual care, ITE: Individually Tailored Exercise, TEA: Targeted Exercise Adherence.

Table 4: Types of exercise for the patient case reported by physiotherapists

	Pre-training	Post-training	Post-intervention
Local strengthening	52 (100)	44 (100)	39 (100)
Flexibility/ range of movement	48 (92)	42 (95)	35 (90)
Proprioception/ balance			
UC	*13 (87)*	*9 (75)*	*11 (85)*
ITE	*11 (50)*	*14 (82)*	*13 (87)*
TEA	*10 (67)*	*11 (73)*	*9 (82)*
Total	*34 (65)*	34 (77)	*33 (85)*
Functional tasks			
UC	*8 (53)*	*10 (83)*	*10 (77)*
ITE	*12 (55)*	*15 (88)*	*11 (73)*
TEA	*6 (40)*	*14 (93)*	*7 (64)*
Total	26 (50)	39 (89)	28 (72)
Aerobic training			
UC	*6 (40)*	*5 (42)*	*2 (15)*
ITE	*1 (4)*	*5 (29)*	*3 (20)*
TEA	*2 (13)*	*6 (40)*	*1 (9)*
Total	9 (17)	16 (36)	6 (15)

Data are number (%) unless otherwise stated. Data only shown by group where differences can be seen. UC: usual care, ITE: Individually Tailored Exercise, TEA: Targeted Exercise Adherence.

Table 5: Exercise delivery for the patient case vignette

	Pre-training		Post-training		Post-intervention	
	Initial treatment session	**Follow-up treatment session(s)**	**Initial treatment session**	**Follow-up treatment session(s)**	**Initial treatment session**	**Follow-up treatment session(s)**
Written information on home exercises						
UC						
ITE	*15 (100)*	*8 (53)*	*12 (100)*	*7 (58)*	*13 (100)*	*7 (54)*
TEA	*22 (100)*	*14 (64)*	*16 (94)*	*15 (88)*	*15 (100)*	*12 (80)*
Total	*13 (87)*	*10 (67)*	*15 (100)*	*11 (73)*	*11 (100)*	*8 (73)*
	50 (96)	32 (62)	43 (98)	33 (75)	39 (100)	27 (69)
Verbal advice on home exercises						
UC	*14 (93)*	*8 (53)*	*11 (92)*	*9 (75)*	*11 (85)*	*7 (54)*
ITE	*19 (86)*	*15 (68)*	*15 (88)*	*14 (82)*	*13 (87)*	*13 (87)*
TEA	*14 (93)*	*9 (60)*	*15 (100)*	*14 (93)*	*10 (91)*	*8 (73)*
Total	47 (90)	32 (62)	41 (93)	37 (84)	34 (87)	28 (72)
Supervision of exercises						
UC	*11 (73)*	*11 (73)*	*10 (83)*	*12 (100)*	*12 (92)*	*10 (77)*
ITE	*15 (68)*	*19 (86)*	*15 (88)*	*16 (94)*	*15 (100)*	*15 (100)*
TEA	*8 (53)*	*11 (73)*	*12 (80)*	*14 (93)*	*10 (91)*	*10 (91)*
Total	34 (65)	41 (79)	37 (84)	42 (95)	37 (95)	35 (90)

Data are number (%) unless otherwise stated. UC: usual care, ITE: Individually Tailored Exercise, TEA: Targeted Exercise Adherence.